

Claims

1. In a process for processing at least one product, the process processing a plurality of lots of the product and comprising a sequence of process steps including
- a first process step,
 - a queue for the process step,
 - a plurality of lots of the product in the queue, and
 - a machine used in the first process step to process the product,
- the improvements for increasing the efficiency of the process and reducing the time required for the product to complete the process, and including the steps of
- (a) determining the lots of the product in the queue of the first process step;
 - (b) determining for each lot in the queue of the first process step the process step which was completed immediately prior to the lots' entering the queue of the first process step;
 - (c) determining for each lot in the queue of the first process step
 - (i) at least the next subsequent process step to be completed by the lot after the lot is processed during the first process step,
 - (ii) the present queue size for the next subsequent process step,
 - (iii) the historical average queue size for the next subsequent process step;
 - (d) determining for the first process step
 - (i) the present queue size, and
 - (ii) the historical average queue size;
 - (e) making a first determination by determining whether the present queue size for the next subsequent process step is one of a pair consisting of
 - (i) greater than the historical average queue size for the next subsequent process step, and
 - (ii) less than the historical average queue size for the next subsequent process step;
 - (f) making a second determination by determining whether the present queue size for the first process step is one of a pair consisting of

- (i) greater than the historical average queue size of the first process step, and
- (ii) less than the historical average queue size of the first process step; and,
- (g) comparing for each lot the first determination with the second determination to prioritize which lot is selected for processing during the first process step.

2. A system for processing at least one product, the system including

- (a) a sequence of process steps;
- (b) at least a first machine in each of the process steps;
- (c) a plurality of lots in the queue of the first machine and each including
 - (i) at least one unit of the product,
 - (ii) memory means including data identifying at least one of a pair including
 - the lot, and
 - a unit of product, andeach of the process steps, and
 - (iii) a first transmitter-receiver device operatively associated with the memory means;
- (d) a second transmitter-receiver device;
- (e) a controller operatively associated with said second transmitter-receiver device and the first machine to generate signals causing said second transmitter-receiver device to communicate with said first transmitter-receiver device and the memory means in each of the lots to
 - (i) determine the previous process step completed by the lot,
 - (ii) confirm that the next process step for the lot requires the first machine, and
 - (iii) generate information used by the first machine to process the product.

3. In a process for processing at least one product, the process processing a plurality of lots of the product and comprising a sequence of process steps including

- a first process step,
- a queue for the process step,

a plurality of lots of the product in the queue,
a machine used in the first process step to process the product, and
at least a second process step during which the machine is used to process the
product,

the improvements for increasing the efficiency of the process and reducing the time
required for the product to complete the process, and including the steps of

- (a) determining the lots of the product in the queue of the first process step;
- (b) determining for each lot in the queue of the first process step the process step
which was completed immediately prior to the lots' entering the queue of the first
process step;
- (c) determining for each lot in the queue of the first process step
 - (i) at least the next subsequent process step to be completed by the lot after
the lot is processed during the first process step,
 - (ii) the present queue size for the next subsequent process step,
 - (iii) the historical average queue size for the next subsequent process step;
- (d) determining for the first process step
 - (i) the present queue size, and
 - (ii) the historical average queue size;
- (e) making a first determination by determining whether the present queue size for the
next subsequent process step is one of a pair consisting of
 - (i) greater than the historical average queue size for the next subsequent
process step, and
 - (ii) less than the historical average queue size for the next subsequent process
step;
- (f) making a second determination by determining whether the present queue size for
the first process step is one of a pair consisting of
 - (i) greater than the historical average queue size of the first process step, and
 - (ii) less than the historical average queue size of the first process step; and,
- (g) comparing for each lot the first determination with the second determination to
prioritize which lot is selected for processing during the first process step.

4. A system for processing at least one product, the system including
- (a) a sequence of process steps;
 - (b) at least a first machine in each of the process steps;
 - (c) a plurality of lots in the queue of the first machine and each including
 - (i) at least one unit of the product,
 - (ii) memory means including data identifying at least one of a pair including
 - the lot, and
 - a unit of product, andeach of the process steps, and
 - (iii) a first transmitter-receiver device operatively associated with the memory means;
 - (d) a second transmitter-receiver device; and
 - (e) controller operatively associated with said second transmitter-receiver device and said first machine to generate signals causing said second transmitter-receiver device to communicate with said first transmitter-receiver device and the memory means in each of the lots to provide said memory means with the time required for said first machine to process the lot.